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HOUSEHOLD BEHAVIOR AND THE TAX REFORM ACT OF 1986

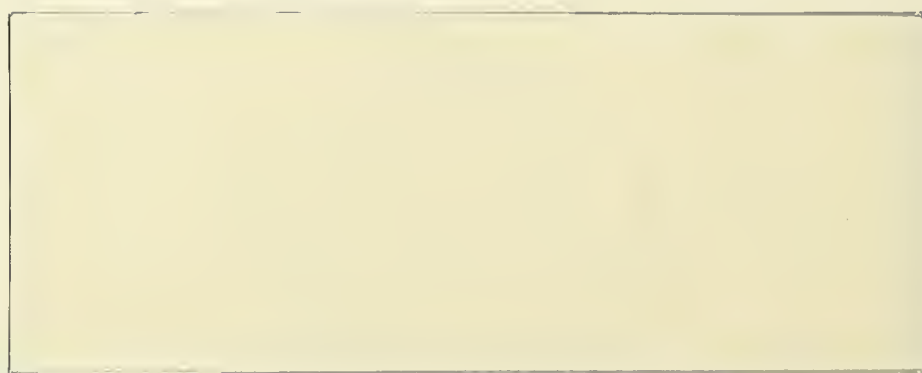
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December 1986

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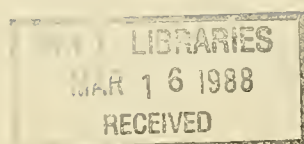
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HOUSEHOLD BEHAVIOR AND THE TAX REFORM ACT OF 1986

ABSTRACT

This paper evaluates the effects of the 1986 Tax Reform Act on household labor supply and savings. It describes the tax bill's effects on incentives to work and to save, and uses recent econometric estimates of labor supply and savings elasticities to describe the reform's impact on household behavior. Two factors lead us to conclude that the new law will have small aggregate effects. First, most households experience only small changes in their marginal tax rates. Forty-one percent of the taxpaying population will face marginal tax rates as high, or higher, under the new law as under the previous tax code. Only eleven percent of taxpayers receive marginal tax rate reductions of ten percentage points or more. Second, plausible estimates of both the labor supply and savings elasticities suggest that even for those households that receive rate reductions, behavioral changes will be small. Our analysis suggests that the tax reform will increase labor supply by about one percent, and slightly reduce private savings.

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President Reagan's May 1985 letter to Congress, accompanying his tax reform proposal, argued that the existing tax system hindered economic growth because "most Americans labor under excessively high tax rates that discourage work and cut drastically into savings." This paper analyzes how the 1986 Tax Reform Act affects these aspects of household behavior.

The recent tax reform has been hailed as the most far-reaching change in the personal income tax since the Revenue Act of 1942 transformed it from a levy on high-income individuals to a broad-based tax. The Joint Tax Committee estimates that the Tax Reform Act lowers federal receipts from the individual income tax by \$121.9 billion between 1987 and 1991. The new law has particularly dramatic effects on individuals with very high and very low incomes. For high income households, the reform reduces marginal tax rates. When the new law takes full effect in 1988, individuals at the top of the income distribution will face marginal tax rates of 28%. As recently as 1970, both earned and unearned income were subject to top marginal rates of 70%. Unearned income was taxed at up to 70% until 1981. For low-income wage earners, the reform lowers average tax payments and removes nearly six million working poor from the federal income tax system.

The popular claim that the Tax Reform Act reduces marginal tax rates for virtually all taxpayers, however, is an exaggeration. Our calculations suggest that in 1988, over forty percent of the taxpaying population will face marginal tax rates equal to, or higher than, the rates they would face under current law. Only eleven percent of taxpayers receive marginal tax rate reductions of ten percentage points or more. In part, these findings account for our conclusion that the tax reform will have relatively small aggregate effects. The modest

changes in marginal tax rates for most households, coupled with the small behavioral elasticities that emerge from most empirical studies, imply small effects on both labor supply and savings.

The paper is divided into four sections. The first sketches the major individual income tax provisions of the Tax Reform Act. Since detailed accounts of the tax law are widely available, we discuss only the provisions that play an important part in our subsequent analysis. The second section examines the tax reform's labor supply effects. Using micro-econometric estimates of household labor supply, we analyze how a number of representative households will respond to the tax reform. The third section discusses the reform's influence on personal saving. We consider the incentive effects of changes in marginal tax rates as well as restrictions on tax-favored savings vehicles. A brief conclusion compares the recent tax reform with the 1981 tax cut, and evaluates the new law's effect in the light of the previous tax change.

1. Salient Features of the Tax Reform Act

Prior to the Tax Reform Act, the personal income tax schedule had fourteen brackets and marginal tax rates ranging between 11% and 50%. Although the new law is frequently described as a two-tier tax system, with marginal rates of 15% and 28%, a variety of phase-out provisions for deductions and exemptions raise marginal tax rates to 33% over sizable income ranges.¹ The two phase-out provisions that affect the largest number of taxpayers are the elimination of (i) the 15% tax bracket, and (ii) personal exemptions. When the new law takes full effect in 1988, a single individual will be taxed at 15% on taxable income up to \$17,850, and at 28% on taxable income above that amount. For single taxpayers

with incomes above \$43,150, however, the benefits of the 15% bracket are gradually reduced. These phase-out provisions raise the marginal tax rate on taxable income between \$43,150 and \$89,560 to 33%. A similar phase-out eliminates the \$1950 personal exemption between taxable incomes of \$89,560 and \$100,480, raising the marginal tax rate to 33% in this range as well. For single individuals with taxable income exceeding \$100,480, the marginal tax rate returns to 28%. Parallel considerations apply to joint and head-of-household returns.

The marginal tax rates on taxable income for both single and married taxpayers are shown below:

Taxable Income ²		
<u>Marginal Tax Rate</u>	<u>Single Taxpayer</u>	<u>Married Filing Jointly (2 Children)</u>
15%	0 - 17,850	0 - 29,750
28%	17,851 - 43,150	29,751 - 71,900
33%	43,151 - 100,480	71,901 - 192,930
28%	100,481 +	192,931 +

This table provides only a broad outline of marginal rates. It does not consider the effect of the Earned Income Tax Credit or the many detailed provisions that generate unusual marginal tax rates for some taxpayers.³

To place the new tax rates in historical perspective, the next table shows the marginal tax rates facing several hypothetical households over the last thirty years. It assumes that each household's real earnings are constant through time and that the household claims the standard deduction each year.⁴

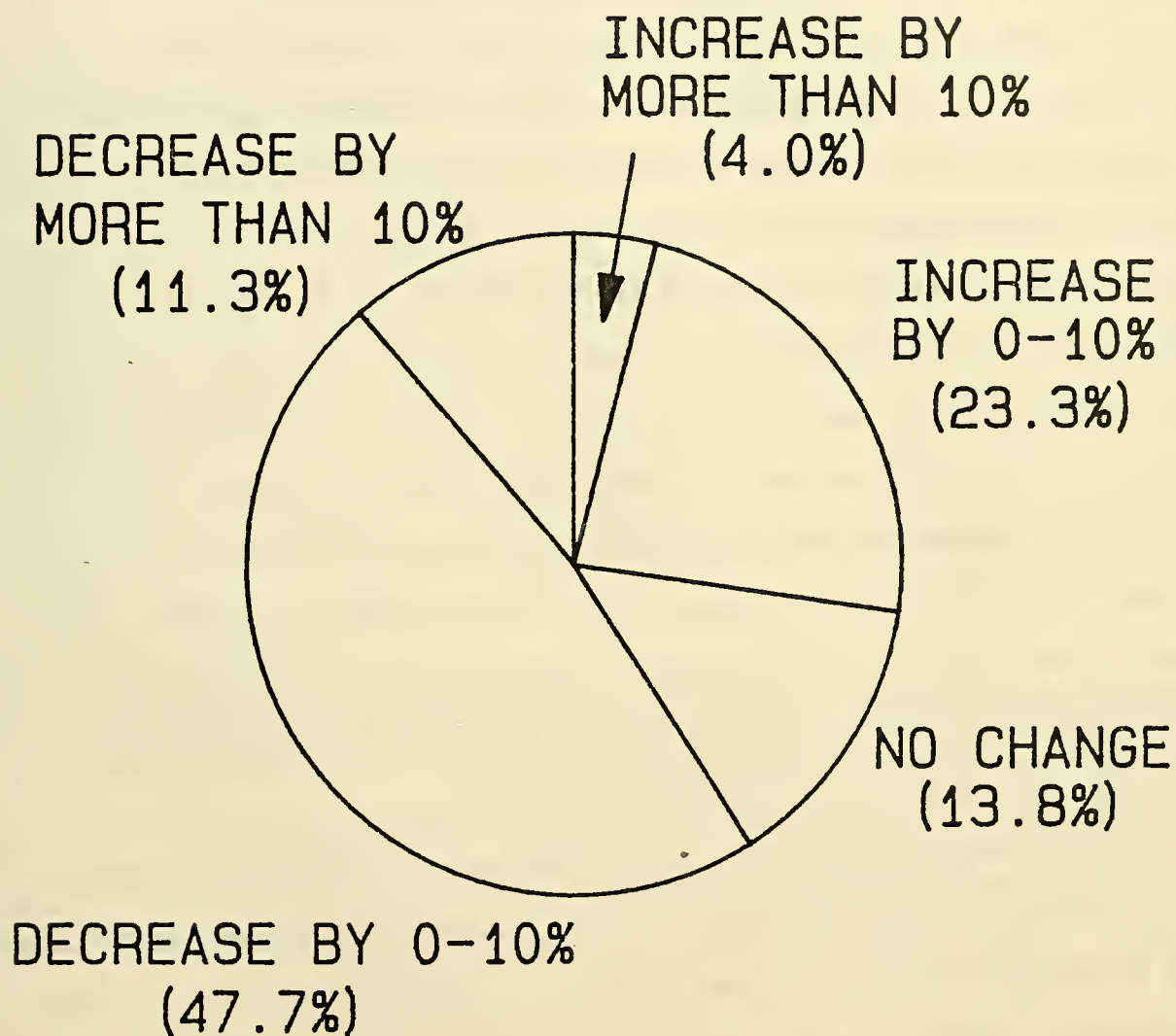
Marginal Tax Rate

<u>Filing Status</u>	<u>Earnings (\$1985)</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1985</u>	<u>1988</u>
Single	\$ 7,500	20	19.5	18	14	15
Single	\$ 14,000	22	22.6	21	18	15
Married Filing Jointly (2 Children)	\$ 25,000	20	19.5	21	18	15
Married Filing Jointly (2 Children)	\$ 40,000	22	22.6	32	28	28
Married Filing Jointly (2 Children)	\$100,000	46	43.1	54	45	33
Married Filing Jointly (2 Children)	\$200,000	62	56.4	64	50	28

The differences between the tax rates in 1980 and 1988 are more striking than those between 1988 and either 1960 or 1970, except at very high incomes. This reflects the gradual impact of "bracket creep," which raised marginal tax rates throughout the 1970s.

These illustrative calculations show that not all taxpayers face lower marginal tax rates as a result of the Tax Reform Act. More detailed information on the distribution of changes in 1988 marginal tax rates is presented in Figure 1. The figure reports calculations based on the NBER TAXSIM model. TAXSIM computes marginal tax rates and tax payments for a synthetic population of over 30,000 1988 taxpayers, constructed by extrapolating from actual 1983 tax returns in the 1983 IRS Public Use Tax Return data file. The calculations suggest that 29.3 million taxpayers (27.3% of the total) will face higher marginal rates after the tax reform than before. An additional 14.8 million (13.8%) face the same marginal rate under the new law as they would have under old law. Increas-

FIGURE 1
MARGINAL TAX RATE CHANGE DISTRIBUTION



ed marginal tax rates are especially prevalent among non-itemizers, the elderly, and low income earners who are not eligible for the Earned Income Tax Credit. Although the majority of taxpayers (58.9%) do receive rate reductions, only 11.2% receive reductions of more than ten percentage points.⁵

One aspect of the Tax Reform Act that Figure 1 does not reveal is the increased number of low-income households that either pay no taxes or receive rebates. TAXSIM calculations indicate that 5.9 million households will be removed from the federal tax rolls as a result of changes in the personal exemption and the Earned Income Tax Credit.⁶ Under old law, an individual earning more than \$3,828 in 1988 would have faced some federal income tax liability. The tax cut-off under new law is \$4,950. For a family of four filing a joint return, the prior-law tax cutoff was \$9,856, compared with \$14,480 under the new law. These changes largely reinstate the degree of tax progressivity for low-income individuals that was found in the tax system of the mid-1970s. Musgrave's (1986) observation that the tax system facing low income persons in 1988 will be more progressive than that in 1979 in part reflects the bracket creep that reduced progressivity throughout the 1970s.

We have described only a few of the numerous provisions in the 1986 Act that will affect household behavior. Some, such as the tax exemption for income from the sale of reindeer and the inclusion of Nobel prizes in the tax base, significantly affect a small number of taxpayers. Others, such as the repeal of the \$100 dividend exclusion, have small consequences for a large number of taxpayers. We now consider the reform's likely impact on two central aspects of household behavior, labor supply and savings.

2. Tax Reform and Labor Supply

The tax reform has both income and substitution effects on labor supply. The income effects operate through changes in the standard deduction, the average tax rate on unearned income, and in marginal tax rates, while the substitution effects are due to changes in marginal tax rates. Both effects vary across households. For the 60% of households that receive marginal rate reductions, the tax reform raises the after-tax wage. This will have a small positive effect on labor supply, as will the extension of the Earned Income Tax Credit.⁷ Other provisions reduce after-tax wages for some households, however. The elimination of the two-earner deduction, previously equal to 10% of the lower-earner's salary up to a maximum of \$3000, will reduce labor supply by secondary earners.⁸ In addition, for the one-quarter of all taxpayers who face higher marginal rates under the new law, the after-tax wage falls and the rewards to labor supply are reduced.

2.1 Estimated Changes in Labor Supply and Deadweight Loss for Primary Earners

Our estimates of changes in labor supply and deadweight loss account for federal income taxes as well as Social Security taxes⁹ and average state income and sales taxes¹⁰. Our analysis focuses exclusively on the fully phased-in tax system of 1988, and ignores the complicated 1987 transition rules. The labor supply function we use is:

$$(1) \quad h^* = \alpha w + \beta y + \gamma Z + \epsilon.$$

The left hand side variable is desired hours of work. The variable w denotes the net after tax wage, Z is a vector of socioeconomic variables, and ϵ is a random

error due to taste variation or optimization error. The variable y is the household's "virtual income." The household behaves as if it has nonlabor income equal to y , even though it may not, because of the after-tax budget segment it faces. Virtual income is determined by market wages and the tax code. Hausman (1981) provides a full definition of virtual income, as well as the parameter estimates for (α, β, γ) that we use.¹¹ A general survey of recent empirical work on labor supply including estimates from specifications other than (1) may be found in Killingsworth (1983).

We first consider the labor supply effects for the average married man, who earned \$11.15 per hour in 1985. Our analysis assumes that his pretax wage is held constant at its pre-reform level. Applying the 1988 tax code to 1985, this individual's marginal federal tax rate would be 15% since his income would be below \$42,550, where the 28% rate begins for a worker with two children filing a joint return.¹² His labor supply would equal 2210 hours per year. Under the old law, his marginal tax rate was 18% and his predicted labor supply was 2190 hours; under the 1975 tax code, his labor supply was 2181 hours. Thus, the 1981 tax reform is estimated to have raised his labor supply by 0.4%, and the Tax Reform Act of 1986 by an additional 0.9%. This probably yields a good estimate of the aggregate effect of the tax bill on male labor supply; Hausman (1983) finds that the behavioral response of the average married man is reasonably close to the average response by all married men.

We now turn to the efficiency cost, or deadweight loss, of the income tax system. The deadweight loss measures the cost of labor-leisure distortions due to income taxation. An individual is not indifferent between (i) a no-tax world, and (ii) a world in which his earnings are taxed at a marginal rate τ and he

receives a lump-sum payment equal to his equilibrium tax payments. Because the individual's behavior is distorted in the second case, he must receive a lump-sum transfer greater than his tax payment to make him as well off as in the no-tax world. Deadweight loss equals the additional transfer, beyond the return of all tax payments, that would be needed to return the individual to his pre-reform utility level. It is computed as the difference between the Hicksian compensating variation and the amount of compensated tax revenue raised:

$$(2) \quad \begin{aligned} \text{DWL}(w_1, w_2, U) &= \text{CV}(w_1, w_2, U) - T(w_1, w_2, U) \\ &= e(w_2, U) - e(w_1, U) - [t(w_2, U) - t(w_1, U)] \end{aligned}$$

where w_1 and w_2 indicate the after-tax wage before and after the tax reform, $e(w_2, U)$ is the individual's expenditure function, $t(w_2, U)$ denotes the amount of (compensated) taxes raised, and U is the level of pre-reform utility.¹³ Distortionary taxes were in place before as well as after the recent tax reform. We therefore compute the change in deadweight loss due to the reform by finding the deadweight loss of both the pre- and post-reform tax codes relative to a system of lump-sum taxes and then taking the difference between these two measures.¹⁴

Our results suggest that the new law does impose a smaller deadweight loss than current law, but that the efficiency gains are not large. Hausman (1981) found that the deadweight loss of the pre-1981 tax system for average married man was 21.8%. For every dollar raised through the tax system, the average household was effectively made worse off by \$1.22 because of distortions created by income taxes. Our calculations for the post-Tax Reform Act scenario imply a ratio of deadweight loss to compensated taxes raised of .135,¹⁵ compared with .165 for the pre-1986 law. Although deadweight loss as a fraction of revenue

falls by 18% because of the Tax Reform Act, this is smaller than the 24% decline (from .218 to .165) that Hausman's (1981) estimates attribute to the 1981 tax reform.

We also did calculations for a high income husband who earned \$10 per hour in 1975, or about \$45,000 per year in 1985 dollars.¹⁶ This high-earning husband would see a reduction in his marginal tax bracket from 33% to 28%; he is well below the earnings of \$84,700 that would put him into the Tax Reform Act's 33% bracket. We estimate the increase in his labor supply to be 1.5%. The ratio of deadweight loss to tax revenue decreases from .326 under old law to .256 under the Tax Reform Act, but both estimates of the efficiency loss are well below Hausman's (1981) value of .542 for the pre-1981 tax system.

2.2 Labor Supply Response of Secondary Earners

We now turn to the effect of the Tax Reform Act on labor supply by secondary earners. In most households with two potential earners, wives are the secondary earners. Our calculations therefore rely upon Hausman's (1981) estimates of labor supply behavior of married women. We assume that the average married woman is married to the average married man, and that she conditions her labor supply on his behavior. This assumption is made in much of the labor supply literature, although it is relaxed in Hausman and Ruud (1984).

The marginal tax rate facing the average married woman depends on the amount of labor she chooses to supply. For her first hour of work, her marginal tax rate is 15% under the new law, compared with 16.2% (.90 times 18%, due to the ten percent two-earner deduction) under the old law. The two earner deduction influenced marginal work incentives for most couples. TAXSIM shows

that only 6.1% of two-earner couples would have incomes in 1988 that caused the \$3000 deduction constraint to bind. The average married woman's marginal tax rate at part time work, twenty hours per week, decreases from 22.5% (.90 times 25%) to 15% because of the tax reform. This rate change is probably the major determinant of the increase in labor supply that we estimate. At full time work, the average married woman faces a marginal rate of 28%. This is a slight reduction from her 29.7% rate (.90 times .33) under old law.

Our estimates suggest that labor supply of wives will increase by 2.64% under the new tax bill. The majority of this increase is due to increased labor force participation, not increased hours of work for participants. We calculate the ratio of deadweight loss to taxes raised to be .250, a decrease from the .305 ratio under the old law. Both of these estimates are well below Hausman's (1981) estimate of .581 based on the pre-1981 tax code.

2.3 Further Issues in Labor Supply

Our analysis of household labor supply focuses exclusively on decisions by several "representative" individuals. The tabulations in the last section that show substantial heterogeneity in the tax reform's effect on different households suggest caution in generalizing from these results. Since most households face small tax rate changes, however, our conclusion that the aggregate labor supply effects are small is unlikely to be reversed by more detailed analysis.

We have also considered only one dimension of labor supply, hours of work. Many other aspects of labor supply may also be affected by the tax bill. With respect to occupational choice, for example, the law has a number of effects. First, the reduction in tax progressivity and marginal tax rates at high incomes

may encourage individuals to choose risky occupations with a small chance of extremely high compensation. If the rewards to occupational risk-taking are generated primarily as capital gains, however, as in many entrepreneurial activities, then the tax bill's increase in the top capital gains rate from 20% to 33% may actually discourage entry into risky fields. Second, the tax reform's elimination of income averaging will discourage entry into occupations with highly variable earnings. Finally, progressivity may encourage schooling. Under previous law, the marginal rates that applied to an individual's foregone earnings were typically lower than the rates at which subsequent rewards to schooling were taxed. By widening brackets and lowering marginal rates the Tax Reform Act reduces this distortion for many individuals.

Our static analysis of the Tax Reform Act may also neglect some potentially important dynamic effects. If households foresee changes in their marginal tax rates, either because of the new law's phase-in provisions or because they think the steady-state level of tax rates is above the 1988 level, some intertemporal substitution of labor supply may occur. Tax return data will surely show such an effect, if only because taxpayers with discretion in reporting their income may transfer income between tax years. Changes in capital income taxation may also affect labor supply. Our analysis is not strictly appropriate for a household making labor-leisure decisions in a lifecycle setting.¹⁷ Changes in after-tax rates of return could affect the lifecycle profile of labor supply, the decision to invest in human capital, and retirement decisions. Available empirical evidence does not provide much evidence on the influence of interest rates on labor supply. For most households after-tax rates of return are not substantially affected by the tax reform, however, so labor supply effects through this channel are probably small.

3. Personal Savings and the Tax Reform Act

The Tax Reform Act will cause a relatively small reduction in private savings. For many households, lower marginal tax rates will reduce the tax wedge between pre-tax and post-tax asset returns and encourage saving. This effect is likely to be offset for most taxpayers, however, by a decline in pre-tax rates of return resulting from increased taxation of corporate capital. After-tax returns will rise for some households and decline for others, but the net effect on household savings is likely to be small.

The Act also restricts tax-favored savings plans which have become an important component of private savings. In 1985, IRA contributions of \$40.8 billion, coupled with 401(k) contributions of approximately twenty billion dollars¹⁸, accounted for nearly half of personal savings (\$129.0 billion) as reported in the National Income Accounts.¹⁹ The new restrictions on tax-favored savings instruments will decrease savings, even though they affect a relatively small fraction of taxpayers.

3.1 Tax Reform and After-Tax Returns

We begin by considering the tax reform's impact on incentives to save through traditional taxable investments such as bonds, corporate stock, and bank accounts.²⁰ The new bill alters the after-tax return to private saving in two ways. First, by lowering marginal tax rates in most assets, it shrinks the tax wedge between pre-tax and post-tax returns. Calculations with the TAXSIM model illustrate these effects. In 1988, the average marginal tax rate on interest income will be 21.7%, compared with 25.8% under old law. The change in marginal tax rates on corporate dividends is even more pronounced, from 33.4% to 25.3%,

although the net effect on the equity tax wedge is smaller because the capital gains tax rate is increased.²¹ Some taxpayers receive larger marginal rate reductions, but as King and Leape (1986) show, these investors already hold lightly-taxed assets such as high-growth corporate stock and tax-exempt debt. Changes in marginal tax rates have a smaller effect on the returns to these investments, and their pretax returns may actually decline as a result of the tax reform.

The positive incentive effects of marginal rate reductions will be largely offset by a second effect, operating through changes in pretax rates of return. The Tax Reform Act raises total marginal tax rates on corporate capital. The elimination of the investment tax credit and the lengthening of asset depreciation lives, as well as other corporate tax changes, more than counterbalance the reduction in investor tax rates (see Auerbach (1987)). The increased tax burden on corporate capital will be reflected both in higher pretax corporate returns, and in lower after-tax returns to investors. Henderson (1986) estimates that the new law will raise the marginal effective tax rate on corporate assets, the difference between pre- and post-tax corporate returns as a percentage of the pretax return, from 37.2% to 42.2%, while reducing the after-tax returns to investors by forty basis points. Her calculations understate the law's actual effects because they omit the various accounting changes that explain a large part of the corporate tax increase (see Auerbach and Poterba (1987)). Other estimates, for example Hendershott (1986), suggest more dramatic changes and call for interest rate reductions of up to two hundred basis points.

Although the tax reform will reduce pretax returns, its impact is unlikely exceed one hundred basis points and it will probably be substantially smaller.

Analyses that suggest much larger effects ignore the role of world capital markets in damping the effect of domestic tax policy shocks on real interest rates. Krugman (1985) concludes that policies which would cause a one point interest rate movement if the United States were a closed economy will actually cause only a 53 basis point change because of capital market integration.

The tax reform's effect on after-tax returns is further complicated by heterogeneity in household marginal tax rates. For some households, marginal savings are done through tax-exempt savings vehicles such as IRAs and the new law affects their incentive to save only through its impact on pretax returns. For households whose marginal savings are not tax exempt, changes in marginal tax rates and pretax returns frequently have opposite effects. For a married joint filer with total earnings of \$25,000 in 1985, the marginal tax rate falls from 18% to 15% because of the reform. Assuming a nominal interest rate of six percent before the tax reform, a real rate decline of only twenty-two basis points will offset the tax-induced increase in aftertax returns. For higher marginal bracket investors, larger interest rate changes are required to offset the tax rate effects. For a married joint filer with a \$100,000 annual income, interest rates could fall by as much as one hundred basis points while still raising the after-tax return to saving. For a household experiencing a marginal rate reduction from 50 to 28 percent, interest rates would have to fall by 1.7 points to offset the marginal rate reduction. After-tax returns will therefore probably rise for high-income individuals who account for a large fraction of total savings.

3.2 The Savings Response to Changing After-Tax Returns

Whether changes in after-tax returns will significantly affect household

savings depends upon the interest elasticity of saving, one of the most controversial parameters in empirical economics. Musgrave and Musgrave (1976) described the consensus view of the mid-1970s: "such empirical evidence as is available does not support the proposition that savings is highly elastic to the rate of interest (p.491)." Since an increase in interest rates has opposing income and substitution effects on current consumption, a small effect can be justified on theoretical grounds. Moreover, the near constancy of the private savings rate through periods of variable real interest rates provides some support for this conclusion.

This analysis is disputed by Summers (1981), who argues that changes in interest rates lead to revaluations of household wealth. In particular, reductions in after-tax returns raise the present value of future labor income, so they will increase household wealth, raise consumption, and therefore lower savings. Summers argues that these effects can be very large, and finds aggregate savings elasticities of roughly two for permanent interest rate changes. Evans (1983) shows that the elasticity may also be much smaller in such models, but does not dispute the possibility of large effects.

Empirical studies have also questioned the traditional view that the interest elasticity is small. Boskin (1978) reported an aggregate interest semi-elasticity of 0.4, but his findings have been disputed by subsequent authors (see especially Howrey and Hymans (1978)). Both studies use aggregate data to estimate "the" interest elasticity, but the findings are inherently difficult to interpret because they do not address the source or persistence of interest rate movements. The savings response to an increase in after-tax returns caused by a temporary tax reduction, for example, should be very different from the change

due to a permanent reduction in marginal rates.

More recent studies have estimated structural models of consumption behavior, and some findings also suggest significant elasticities. Hansen and Singleton's (1983) estimates using aggregate time series data, as well as those by Paquette (1985) and Zeldes (1985) using panel data, suggest aggregate savings elasticities with respect to the short term interest rate of about one. Summers (1984) provides a more detailed discussion of this evidence. These estimates from structural models probably overstate the interest sensitivity of consumption, however. They rely on a specification of preferences that constrains the household's risk aversion and intertemporal elasticity of substitution to be determined by the same parameter. Hall (1985) relaxes this restriction and finds a substantial risk aversion coefficient but very little evidence of intertemporal substitution. His estimates imply virtually no savings response to after-tax returns.

These conflicting estimates underscore the uncertainty that still surrounds this critical parameter for tax policy analysis. The relative stability of the personal savings rate through periods of widely varying real interest rates may provide the best evidence on the impact of the Tax Reform Act's changes in after-tax returns. This suggests that the new law will cause a relatively small adjustment in household saving.

One explanation for the relatively small degree of observed intertemporal substitution in consumption is that a sizable fraction of households are liquidity constrained (see Hayashi (1985) for a survey). Such households are at a corner, holding little or no wealth. Avery et al. (1984) report that the Federal Reserve Board's 1983 Survey of Consumer Finances shows that 12% of

households have no financial assets, while an additional 36% have net financial assets worth less than \$2,000. Similar results have emerged from numerous studies of household wealth (see Diamond and Hausman (1984)). Households with virtually no wealth are already setting their savings equal to zero; reductions in after-tax returns are unlikely to further reduce their savings.

The Tax Reform Act significantly increases the disposable income of low-income households who may be subject to liquidity constraints. TAXSIM estimates suggest that in 1988 the new law will lower taxes on those with adjusted gross incomes of less than \$20,000 by \$4.8 billion per year. By comparison, it raises total tax payments by households with AGIs above \$75,000 by \$5.8 billion annually. These redistributive effects will reduce the aggregate savings rate.

3.3 Changes in Individual Retirement Accounts

The Tax Reform Act also affects savings through its restrictions on Individual Retirement Accounts and other tax-deferred savings vehicles. Twenty-four million taxpayers made IRA contributions in 1985. The total amount invested in IRA and Keogh plans has grown from \$46.7 billion in December 1981, before the extension of IRA eligibility to all wage-earners, to \$231.8 billion in July 1986.²² Income from these assets is untaxed when it accrues, but is taxed as ordinary income when the assets are withdrawn from the IRA. There is a ten percent penalty for withdrawals before age 59½.

Under old law, each wage-earner was permitted to make a \$2,000 tax-deductible annual IRA contribution. Two-earner couples could contribute up to \$4,000. The Tax Reform Act limits the deductibility of IRA contributions for high-income taxpayers. For a single taxpayer who is not covered by an

employer-maintained retirement plan, or who is covered by such a plan but whose AGI before deducting IRA contributions is below \$25,000, nothing changes. A single taxpayer with income above \$35,000 cannot make tax deductible contributions, however, and one with an income in the \$25-35,000 range can deduct only a fraction of his IRA contribution. Similar provisions with different cutoffs apply to other types of tax filers. Taxpayers who cannot deduct their IRA contributions from taxable income may still contribute to IRAs, and the accruing income is still untaxed under the new law.

Assets held in IRAs earn significantly higher after-tax returns than those held in taxable accounts. These accounts are attractive both because asset returns are taxed at the taxpayer's post-retirement marginal rate, typically below his rate while working, and because the assets grow at the pre-tax rate. For someone 30 years from retirement, facing a current marginal tax rate of 33% and a marginal tax rate of 16% during retirement, with a current interest rate of eight percent and an inflation rate of four percent, investing through an IRA is equivalent to receiving a nominal yield of 13.1%.²³

The Tax Reform Act's restrictions on IRA deductability will reduce the use of IRAs, but it is easy to exaggerate their importance. Four arguments suggest that IRAs will continue to be widely used. First, IRAs remain very attractive savings vehicles under the new law, even when contributions are not deductible. For an individual in the 33% bracket during his working life and the 15% bracket when retired, with income high enough to prevent IRA deductibility, a contribution 30 years before retirement will be worth 1.97 times as much on the retirement day as a similar taxable investment. Even for someone in the 33% bracket both while working and while retired, the IRA would be worth 70% more than a

taxable account. Although the Tax Reform Act's general reduction in marginal rates reduces the implied yield differential between IRAs and taxable investments, IRAs should still be used by most long-horizon investors.

Second, the IRA restrictions affect only a small part of the contributing population. The Employee Benefit Research Institute (1986) estimates that only 15% of taxpayers who made IRA contributions in 1985 will completely lose the deductibility of their contributions, while another 12% will be eligible for only partial tax deductability. Even assuming that all of these taxpayers would have contributed the maximum allowable if they had been allowed the deduction, and that they would contribute nothing (an extreme case) in the absence of the deduction, IRA saving would be 60% as large under the new law as in 1985.

Third, even if IRA contributions do fall, this does not necessarily imply that private savings will decline. For many households that face deductibility restrictions, IRAs are not a marginal savings vehicle. Most contributors who lose deductibility were previously making the maximum contribution, so the removal of deductibility does not affect their marginal after-tax return to saving.²⁴ For these households, marginal savings are invested in non-IRA assets, and their marginal return is the return on these assets.

Finally, the new law preserves the incentives for banks and other financial institutions to promote a "psychology of savings" and encourage IRA contributions. The importance of psychological factors in determining savings behavior is stressed by Katona (1975, chapters 15 and 16). The combined effects of IRA advertising campaigns and the immediate tax savings associated with IRA contributions may account for the pronounced increase in contributions immediately before the tax-filing deadline. For the period 1982-1986, when the average

monthly change in real IRA and Keogh assets was 2.2 billion 1986 dollars, the average changes in March and April were respectively \$3.7 and \$6.3 billion. Thirty-seven percent of IRA contributions were made in these two months. This probably indicates that some IRA contributors value liquidity enough to delay their contributions, but it may also in part result from the mass media campaigns encouraging savings.

3.4 Changes in Other Targeted Savings Vehicles

The Tax Reform Act also changes provisions for a number of other tax-favored savings plans. The most important of these are 401(k) plans, employer-operated profit-sharing plans that employees contribute to through salary reductions or from bonuses. Employers can match employee contributions, and 401(k) plans have less restrictive withdrawal provisions than IRAs. This makes 401(k) plans one of the most attractive savings instruments at present, and accounts for their rapid growth.

Although 401(k) plans were instituted less than a decade ago, and the regulations that permitted their widespread use were only promulgated in 1982, they have expanded rapidly. Ninety firms in the Fortune 100 had 401(k) plans in 1985. Although no official data are available, as many as 15 million persons may have contributed to 401(k)s in 1985, and the Congressional Budget Office forecast (under old law) called for a doubling of the number of participants by 1991.²⁵ The assets held in 401(k) plans were estimated at \$31.7 billion in 1986 and were projected to grow to \$153.7 billion (1986 dollars) by 1991.

Prior to the Tax Reform Act, an individual was permitted contributions equal to the maximum of \$30,000 or 25% of his salary. The new law caps these

contributions at \$7,000 per year. These restrictions will affect a relatively small fraction of the current participants in 401(k) plans, however. Data on the use of 401(k) plans under current law compiled by Greenwich Research Associates (1985) shows that 11% of plan participants contribute less than 3% of their salary, 59% contribute 3-6% of their salary, 16% contribute 6-10% of their salary, and only 1% of current participants place more than 10% of their salary in a 401(k) plan. The mean contribution is less than \$2000, and only 6% of 401(k) participants are estimated to contribute more than \$7000 per year.²⁶

The impact of 401(k) restrictions is less clear than the impact of IRA limitations. Even though few contributors currently exceed the new contribution cap, they may account for most of the dollars contributed to these plans. If the average contribution for those contributing more than \$7,000 is \$15,000, these individuals account for half of all contributions. The new limits would reduce 401(k) contributions by 25% in this case. Although contributions by current contributors will decline, there is an offsetting effect because individuals previously eligible for tax-deductible IRAs may transfer their saving into still-deductible 401(k)s.

3.5 Further Issues in Tax Reform and Savings

The tax reform's impact on interest rates and ultimately on investment hinges on its effect on national savings, which is the sum of personal, corporate, and government saving. In addition to the effects on personal savings described above, the new law may have important effects on both corporate and government saving. The Joint Tax Committee estimates that the bill raises corporate taxes by \$120 billion over the next five years, reducing personal

taxes by an equal amount. The household sector's propensity to save out of disposable income is substantially below the corporate sector's savings rate out of after-tax profits, so the tax bill transfers income from a high-saving sector (corporations) to a low-saving sector (households). This will reduce national savings unless households "pierce the corporate veil" and recognize corporate savings on their behalf.²⁷

The Tax Reform Act may also affect national saving through its influence on the federal deficit. The bill's net revenue effects are difficult to predict accurately, especially since many of the behavioral assumptions in the Joint Tax Committee's revenue projections are not publicly available. Predicting the extent of income re-timing and other accounting-induced changes in tax liability during the phase-in period is especially problematic. Since changes in the government deficit can affect national savings (see Poterba and Summers (1986)), the Tax Reform Act's revenue impact will be a key factor in its total effect on national savings.

Finally, the Tax Reform Act will affect savings by inducing changes in a variety of asset prices. With respect to corporate capital, the Act increases tax burdens on new assets while reducing burdens (through the reduction in corporate rates) on old capital. This conveys a windfall to the holders of existing capital, primarily older households. These households have a higher marginal propensity to spend than do younger households, so this redistribution will also reduce savings. Other asset prices will also adjust. For example, reductions in the marginal tax rates facing high income individuals may reduce the price of luxury homes (see Poterba (1986)). The tax bill's net effect on the value of household net worth is complicated, but clearly important for understanding its ultimate savings effects.

4. Conclusions

Our analysis suggests that the Tax Reform Act will cause relatively small changes in both household labor supply and savings. For married men we expect an increase in labor supply of less than one percent, although the impact on secondary earners could be somewhat larger. The bill's impact on savings is difficult to assess because the reform affects different assets in different ways, but we expect a small decline in savings. This results in part from a reduction in the after-tax returns available to investors in taxable assets, in part from restrictions on tax-favored savings vehicles, and in part from redistribution toward households with high spending propensities. Our findings of small behavioral effects are not surprising, however, since for middle income taxpayers who did not make wide use of tax shelters, the Tax Reform Act changes marginal tax rates relatively little.

Our results do not imply that the tax reform has only small incentive effects. The complicated transition rules which govern income earned in 1986 and 1987 are bound to induce significant changes in reported economic activity, and probably in real behavior as well. Newspaper accounts during the House-Senate Conference Committee's deliberations described tax shelters being hastily organized to take advantage of grandfathering provisions. The realization of capital gains may also be distorted by the transition to a new tax regime. Long-term gains realized in 1986 are taxed at a top marginal rate of 20%, while those in 1987 are taxed at rates of up to 28%, and after 1988 capital gains are not distinguished from other types of income and they could therefore face tax rates of up to 33%. Realization of capital gains is a highly discretionary activity, so significant gain-taking may occur before the new law takes

effect.

Although our analysis has relied primarily on econometric evidence to assess the behavioral effects of the tax reform, another type of evidence may be even more persuasive in the current context. The marginal rate reductions in the new law are considerably smaller than the 23% cut in rates that followed the 1981 tax reform, except for very high income individuals. Although the two reforms are not directly comparable because the 1981 Economic Recovery Tax Act reduced total revenue by lowering corporate and personal taxes in tandem while the Tax Reform Act of 1986 is designed to be revenue neutral, the evidence on household response to the 1981 tax reform is useful nonetheless.

With respect to labor supply, Lindsey (1986) compares the amount and distribution of income reported on tax returns with a baseline projection based on pre-1981 tax return data. He finds an increase in taxable income during the 1982-1984 period of roughly two percent relative to what would have been expected in the absence of the tax cut. These effects are larger than our analysis would predict, but as we would expect, the response is largest among high income individuals who received the largest rate cuts. The difficulty of separating changes in labor supply from changes in reporting practices and the complicating effects of macroeconomic events unfortunately complicate the interpretation of Lindsey's results.

The savings experiment is also enlightening. During the last five years, real interest rates have reached record highs and tax rates have been reduced, raising the after-tax return to savers. In 1980, the average married man's real after-tax return to savings through a Treasury-bill fund was -1.37%. In 1985, the after-tax real return was 3.66% if marginal saving was channeled into an IRA

and 2.32% if through taxable channels.²⁸ Even more dramatic increases in real after-tax returns have occurred for individuals near the top of the income distribution. Despite this dramatic change in the return to saving, aggregate savings have if anything declined.²⁹ The National Income Accounts personal savings rate, which averaged 8.7% between 1971 and 1975 and 7.1% between 1976 and 1980, averaged 6.2% over the last five years. Consumption as a share of GNP has risen from 62.7% in the 1970s to 64.5% since 1981. Even if the household savings rate is defined as the change in real net worth divided by disposable income, so that it rises with the recent stock market boom, the average savings rate is only 10.2% for the 1981-85 period compared with 13.2% during the 1970s and 13.1% during the 1960s. This evidence suggests that changes in after-tax returns of the type generated by the recent tax reform are also unlikely to have large effects on savings behavior.

Footnotes

1. The NBER TAXSIM model estimates that 3.4 million of the 107.4 million tax returns filed in 1988 will face the 33% bracket.
2. Taxable income equals adjusted gross income minus deductions and exemptions. The personal exemption equals \$1950 in 1988, and \$2000 thereafter. The standard deduction in 1988 is \$3000 for returns by single individuals, and \$5000 for married joint filers.
3. Among the other rates that will affect some taxpayers are: (i) The 49.5% marginal rate for taxpayers with incomes of between \$100,000 and \$150,000 and whose passive loss deduction of \$25,000 is being phased out. (ii) The 21% minimum tax rate. (iii) The 26.25% marginal rate for taxpayers who face the minimum tax and also are in the income range over which their personal exemption is being phased out. (iv) The 25% rate facing taxpayers eligible for the Earned Income Tax Credit, when the credit is being phased out. (v) The 33.6% rate facing an individual who makes an IRA contribution and has taxable income in the IRA deduction phase-out range. Many additional rates arise from the phase-out provisions for medical and child care deductions.
4. We ignore variation over time in allowable deductions, such as consumer interest, which could have a significant effect on the marginal tax rates facing some households. Our marginal tax rate estimates for 1988 assume that nominal earnings grow at the inflation rate forecast by the Congressional Budget Office for the 1986-1988 period.
5. These calculations weight each tax return equally. Similar findings emerge when we weight tax returns by married couples twice as heavily as those by single persons; 12.1% receive marginal rate reductions of 10% or more, 11.5% face the same marginal rates before and after the reform, and 22.3% face higher marginal rates.
6. Many low-income persons will still participate in the Social Security system and therefore pay FICA taxes, although they have no income tax liability. For 3.1 of the 18.3 million persons who will face no federal income tax liability in 1988, however, the Earned Income Tax Credit largely offsets FICA.
7. The new law raises the credit rate from 11% to 14%, and expands its coverage. For a head of household with one child, earnings below \$5714 receive a credit of 14% under 1988 law. Earnings between \$5715 and \$8999 are untaxed, while those between \$9000 and \$10251 (the earnings level at which he enters the ordinary tax system) face a marginal rate of 10% due to the EITC phase-out. Between \$10251 and \$17000, the marginal rate is 25% due to the combined effect of the EITC phase-out and the ordinary tax schedule. For earnings above \$17000 the marginal rate is again 15%.
8. Previous studies suggest that the two-earner deduction has significant labor supply effects. Hausman (1981) found a 1.8% increase in wife's labor supply prior to the 1981 reform, and Feenberg and Rosen (1983) found similar effects. The impact of this deduction, had it been preserved, would have been smaller than under old law as a result of the reduction in marginal tax rates.

9. We use only the employee portion of FICA because estimates of returns to Social Security by Boskin et al. (1986) suggest the marginal benefit to be approximately 50% of marginal taxes paid for two-earner couples, and slightly more for single-earner households.

10. The Tax Reform Act's elimination of state and local sales tax deductibility also reduces the real after-tax wage, but this effect is trivial. For a household using the federal tax return tables for state sales tax liability, a \$1 increase in income leads to about a one cent increase in deductions. At a marginal tax rates of 30 percent, this means eliminating sales tax deductibility induces only a .3% change in the marginal wage tax rate.

11. The estimates in Hausman (1981) are based on a 1975 data sample, so we deflate 1986 dollars to 1975 levels using percentage changes in average hourly earnings. Since real wages have changed very little during this period, the use of mean estimates from 1975 should not have a large effect on the results. The parameter estimates for husbands are the convex estimates from Hausman (1981, p.51); those for wives are the nonconvex estimates from Hausman (1981, p.56).

12. Earnings of \$43,500 translate into taxable income of \$29,750 when we subtract the \$5,000 standard deduction for married joint filers, and four times the personal exemption of \$1950. The Earned Income Tax Credit is completely phased out at incomes of \$17,000, so it has no effect on the average married man.

13. We calculate deadweight loss using the expenditure function based on the labor supply function of equation (1):

$$e(w,U) = e^{-\beta w_U} - \frac{\alpha w}{\beta} + \frac{\alpha}{\beta^2} - \frac{Z\gamma}{\beta}.$$

Compensated taxes are calculated from the compensated labor supply function, which equals $-\partial e(w,U)/\partial w$.

14. It would also be possible in this setting to compute the deadweight loss of the existing tax system relative to a more realistic alternative than lump-sum taxes, such as a proportional tax scheme.

15. Compensated hours of work are estimated to be 2068 per year. Compensated taxes raised are \$1474, and the compensating variation is \$1673 for the average married man.

16. The high-income husband corresponds approximately to the mean of the top quintile in the 1975 Panel Survey of Income Dynamics sample.

17. MaCurdy (1981) and Hausman (1985) provide more detailed discussions of labor supply in a lifecycle setting.

18. There are no systematic national data available for 401(k) plans. Our estimate of employee contribution levels is based on the EBRI (1985) estimate of 15 million participating employees in 1985, coupled with data from Greenwich Research Associates (1985) that mean contributions are just below \$2000.

19. Some IRA and 401(k) contributions are not net savings but are simply transfers from other accounts. This is especially likely to be the case in the first few years after these savings programs are introduced.

20. Data from the Federal Reserve Board (1986) show that taxable bonds, other interest bearing assets and corporate stock account for 73% of household liquid wealth. Of the remaining 27%, 23.6% is held through tax-exempt pension funds.

21. Assets that yield returns primarily as capital gains are taxed more heavily under the Tax Reform Act than under prior law. The marginal tax rate on long term gains, which could not exceed 20% in 1986, will rise to 33% in 1988 and thereafter. For investors whose marginal savings are channelled into high-gain assets, the marginal tax burden on savings will increase. The relationship between dividend taxes, capital gains taxes, corporate taxes, and the pretax return is detailed in Poterba and Summers (1985).

22. Although most of the increase in contributions is due to IRAs, tax changes in the post-1981 period have also encouraged Keogh plans by raising the contribution limit and changing the tax treatment of personal service corporations. We calculate the value of IRA and Keogh assets using the Federal Reserve Board's report on asset holdings, which exclude some institutions that provide IRAs, and grossing up by the ratio of total IRA and Keogh holdings from Pension Facts 1985 to obtain the total value.

23. The value at retirement of one dollar of earned income invested in an interest-bearing asset is

$$V_{\text{tax}} = (1-t_0)e^{[(1-t_0)i - \pi]T}$$

where t_0 is the tax rate while working, i denotes the nominal interest rate and π the inflation rate, and T is the number of years until retirement. By comparison, investing one dollar through an IRA, with full deductibility of the IRA contribution, yields

$$V_{\text{IRA}} = (1-t_r)e^{[i-\pi]T}$$

where t_r denotes the marginal tax rate during retirement. The analogous value of a non-deductible IRA contribution held until retirement is:

$$V_{\text{IRA}}^* = (1-t_0)e^{[i-\pi]T} - t_r(1-t_0)[e^{[i-\pi]T} - 1].$$

24. Galper and Byce (1986) report that 38.4% of IRA contributors made contributions below their legal maximum. For these taxpayers, the IRAs affected marginal returns to saving. Venti and Wise (1986) estimate that only 20% of contributions were financed from reductions in other asset stocks. They find 30% were financed from current tax savings, and 50% with reduced consumption. Moreover, they found that the median financial wealth of IRA contributors was about \$8500, suggesting that after a few years most financial assets for many contributing households would be transferred into IRAs and that these plans would become the marginal source of savings.

25. Forecasts of future 401(k) contributions and asset growth were provided by Larry Ozanne of the Congressional Budget Office.

26. The fraction of 401(k) participants who are currently contributing more than \$7000 per year is reported in the Wall Street Journal 2 September 1986.
27. The available empirical evidence, Feldstein (1973) and Howrey and Hymans (1978) for example, suggests nearly one-for-one offsets between personal savings and corporate savings, but the estimates are imprecise. The new tax reform provides a powerful test of this view.
28. The IRA return is not a one-period return but presumes stationary interest rates and withdrawal after retirement.
29. Poterba and Summers (1986) provide a more detailed discussion of recent savings experience.

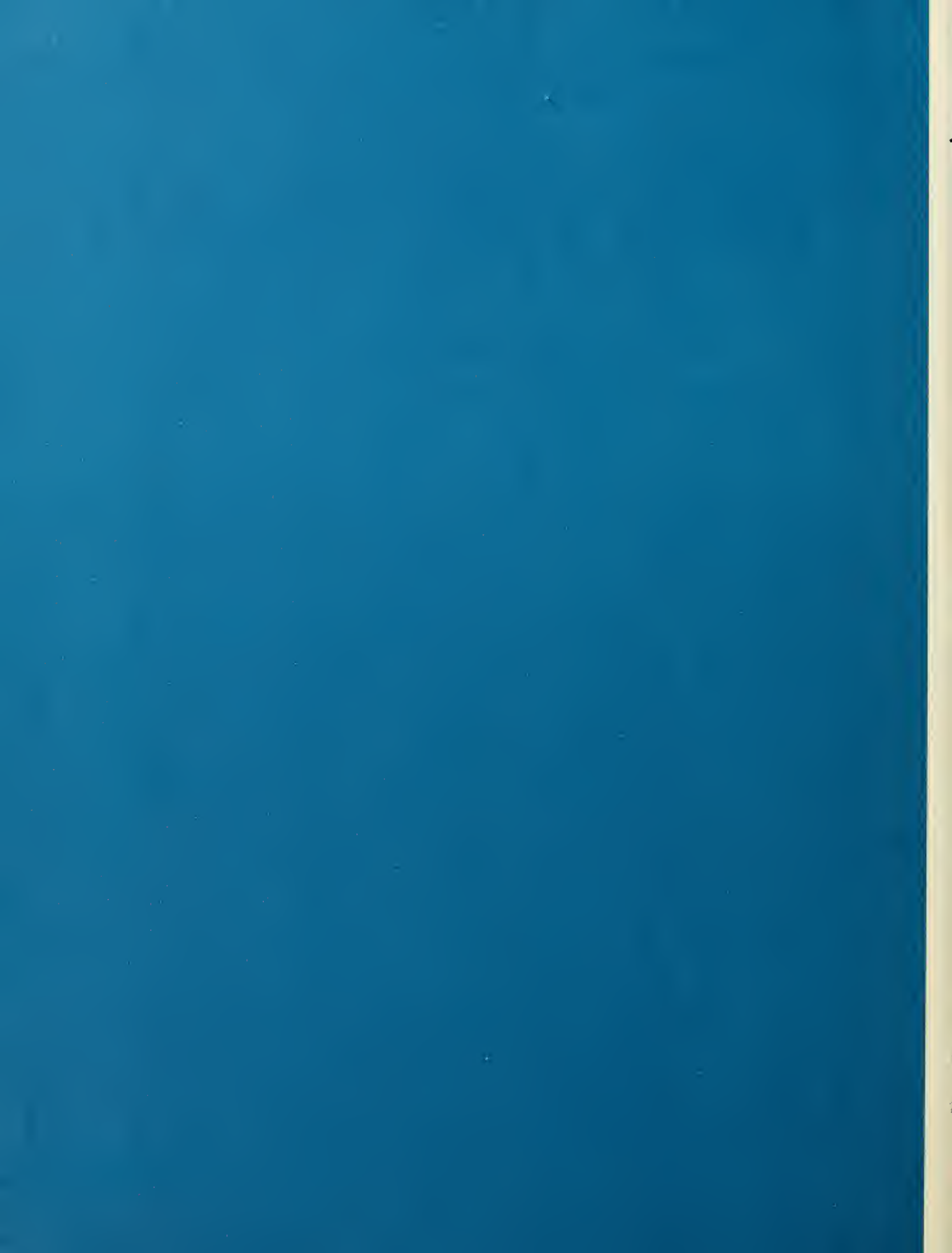
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